Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

1. (Original) A method for checking the integrity of GPS measurements for a moving vehicle comprising:

determining a first inter-vehicle distance between the moving vehicle and a second vehicle based on GPS measurements obtained at both vehicles;

independently determining a second inter-vehicle distance based on relative motion of the moving vehicle and the second vehicle obtained using INS sensors at both vehicles;

comparing the first and second inter-vehicle distances; and

confirming the integrity of the GPS measurements as a function of whether the first and second inter-vehicle distances are substantially equivalent.

2. (Currently Amended) A method for checking the integrity of GPS measurements for a moving vehicle comprising:

determining a first inter-vehicle distance between the moving vehicle and a second vehicle based on GPS measurements obtained at both vehicles;

independently determining a second inter-vehicle distance based on relative motion of the moving vehicle and the second vehicle obtained using INS sensors at both vehicles;

comparing the [[the]] first and second inter-vehicle distances; and

confirming the integrity of the GPS measurements as a function of whether the first and second inter-vehicle distances are substantially equivalent;

wherein the step of determining a first inter-vehicle distance includes:

obtaining a first set of GPS measurements at the moving vehicle;

obtaining a second set of GPS measurements at the second vehicle; and

mutually communicating the first and second sets of GPS measurements to the respective second vehicle and moving vehicle.

3. (Original) A method of detecting an error at a particular vehicle by communicating GPS data among multiple vehicles within a given vicinity, the method comprising:

generating test series data at each vehicle for each pair of vehicles receiving GPS signals from a satellite, the test series data for each pair comprising a difference between a first inter-vehicle distance between the pair of vehicle calculated based on GPS data and a second inter-vehicle distance independently calculated based on INS sensors in each of the pair of vehicles;

identifying which test series data have values greater than a threshold, indicating an error; and

if an error is indicated, determining which of the multiple vehicles the error occurs in by comparing the test series data generated at each vehicle.

4. (Previously Presented) A method of detecting an error at a particular vehicle by communicating GPS data among multiple vehicles within a given vicinity, the method comprising:

generating test series data at each vehicle for each pair of vehicles receiving GPS signals from a satellite, the test series data for each pair comprising a difference between a first inter-vehicle distance between the pair of vehicle calculated based on GPS data and a second inter-vehicle distance independently calculated based on INS sensors in each of the pair of vehicles;

identifying which test series data have values greater than a threshold, indicating an error;

if an error is indicated, determining which of the multiple vehicles the error occurs in by comparing the test series data generated at each vehicle; and

detecting an error at a particular vehicle if a particular vehicle has errors in all test series it generates with respect to a particular satellite, and the other of the multiple vehicles show an error in only test series pertinent to the particular vehicle with respect to the particular satellite.

5. (Original) The method of claim 4, further comprising:

waiting for a suitable period;

determining whether the error still exists at the particular vehicle; and

if after the suitable period has elapsed the same error still exists, identifying the error as a receiver error.

6. (Original) The method of claim 5, further comprising:

if during the suitable period, the error changes in magnitude or no longer exists, identifying the error as a GPS multipath error.

7. (Original) The method of claim 6, further comprising:

identifying a magnitude of the error as a level of GPS multipath at a location of the particular vehicle;

obtaining a satellite constellation at a time the error is detected; and

associating the level of GPS multipath with the location and the satellite constellation.

8. (Withdrawn) A method of mapping GPS multipath levels at each point in a vicinity for an entire range of satellite constellations, comprising:

a) detecting a GPS multipath error at a particular point in the vicinity for a satellite constellation using multiple roving GPS receivers;

b) recording the multipath error as a GPS multipath level for the particular point and the satellite constellation; and

c) repeating steps a) and b) for all other points in the vicinity and at different times to capture the entire range of satellite constellations.

9. (Withdrawn) The method of claim 8, wherein each of the multiple roving GPS receivers generates test series data for each pair of the roving receivers obtaining signals from a same GPS satellite, the test series data for each pair comprising a difference between a first inter-vehicle distance between the pair calculated based on GPS data, and a second inter-vehicle distance independently calculated based on INS sensors in each of the pair of vehicles.

10. (Currently Amended) A system provided in a vehicle for checking the integrity of GPS measurements for a moving vehicle comprising:

means for receiving GPS signals and for determining a GPS ~~psuedo~~ pseudo range of the vehicle;

means for communicating with a second vehicle within a vicinity of the vehicle;

a processor capable of determining a first inter-vehicle distance between the vehicle and the second vehicle based on the pseudo range of the vehicle and on GPS measurements communicated from the second vehicle; and

an INS system including inertial sensors, the INS system providing information allowing the processor to determine a relative motion of the first vehicle;

wherein the processor determines a second inter-vehicle distance based on the relative motion of the first vehicle and on a relative motion of the second vehicle detected using an INS system of the second vehicle and communicated from the second vehicle, and compares the first and second inter-vehicle distances, the integrity of the GPS measurements being determined as a function of whether the first and second inter-vehicle distances are substantially equivalent.

11. (Original) The system of claim 10, wherein the means for communicating with a second vehicle includes a wireless communication device.

12. (Original) The system of claim 11, wherein the vicinity includes an area within a radius of 10 kilometers of the vehicle.

13. (Withdrawn) A system for providing a mapping of GPS multipath levels at each point in a vicinity for an entire range of satellite constellations, comprising:

a central information depository; and

multiple roving GPS receivers including means for detecting a GPS multipath error at a particular point in the vicinity for a particular satellite constellation;

wherein the multipath error is recorded as a GPS multipath level for the particular point and satellite constellation at the central information depository;

and wherein the detection of multipath error is repeated for all other points in the vicinity and at different times to capture the entire range of satellite constellations, the multipath errors being stored at the central information depository.

14. (Withdrawn) The system of claim 13, wherein the central information depository includes means for receiving wireless data signals, and the multiple roving GPS receivers are equipped with means for wirelessly transmitting GPS multipath errors as a data signal to the central information depository.